American Fern Journal

Vol. 1 OCTOBER 1911 No. 6

Notes of a naturalist afloat—I

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(PLATE 5)

The private log of a youngster alive to the beauty of nature and enthusiastic in the study of her works, is apt to abound in hyperbolic descriptions of the sea and sky and shore. It is with mingled feelings of amusement and regret that I sometimes look over the records of my early cruises and find in them the picture of the boy I used to be. Much that I wrote might, perhaps, have better been left unwritten; but occasionally I come across the account of an expedition or an experience which I think may be worth keeping.

My first cruise was in the old *Powhatan*, an archaic side-wheel man-of-war, which had served Commodore Perry as flagship while he was making his memorable treaty with Japan. We made a trip to the Isthmus of Panama in the spring of 1881, carrying with us a relief crew and officers for the U. S. S. *Alaska*, then on the Pacific station. In crossing the Isthmus I took notes on the vegetation, especially on the ferns and palms, which may be of interest to the general reader as well as to the botanist unfamiliar with the tropics, though they doubtless contain little that is new. Many of the plants I saw could not be determined at the time, but afterwards I supplemented my notes with information obtained from the published reports of scientific expeditions, as well as from other sources.

[No. 5 of the JOURNAL (1: 93-120) was issued 7 Au 1911.]

ACROSS THE ISTHMUS OF PANAMA

The *Powhatan* came to anchor in Aspinwall harbor, on the north side of the Isthmus, at nine o'clock on the morning of April 4, 1881, having made the passage from New York in eleven days. The water was green as a catbird's egg, in sharp contrast to the deep indigo of the Caribbean sea, through which we had just been steaming. The town of Aspinwall (or Colon) looked rather picturesque from our anchorage, with several white buildings surrounded by balconies and galleries and a line of native cottages beneath crested coconut palms; but we found the streets very dirty and ill-smelling when we went ashore. The island on which the town is built is very little above the sealevel and the greater part of it was at that time a brackish swamp. All the fresh water was hauled by the railroad into the town, and it was apparent from the looks of the natives that they did not waste it in washing. The great majority of those we saw were negroes or mulattos, including the prefect, who visited our ship with his staff and received a salute of thirteen guns.

My first walk was along the beach to the right, where after some time I came to a mangrove swamp, the first I had ever seen. In the marshy ground there was first of all a dense growth of a coarse, simply pinnate fern, with the upper pinnæ fertile and cinnamon-colored. This proved to be *Acrostichum aureum*, a species found in tropical marshes all over the world. Near by there was a great lagoon into which the town of Aspinwall was drained. It was said to be the resort of alligators, but I saw none. I did, however, see a crested iguana, a lizard, which it is said the natives eat with relish.

About the margin of the swamp was a dense thicket of bushes and small trees, some of which were propped up on arched aerial roots above the level of high tide. The foli-

age of this species was smooth and glossy and the pendent fru t, cigarshaped or fusiform, had in some cases begun to sprout while still hanging on the limbs. This proved to be *Rhizophora mangle*, the most common mangrove of tropical shores. Another species had olivelike leaves, white beneath, and clusters of small inconspicuous flowers. It was without the arched roots of the species just described, but it sent up from out the mud peculiar fingerlike vertical breathing roots. This proved to be *Avicennia nitida*, also a widely distributed species. Perched among the branches of the mangroves were herons and egrets, gray and white, and swarming among their roots were myriads o crabs, most of them with one great claw, which they held up in a menacing attitude.

On boarding the train to cross the Isthmus I met several French engineers, from whom I got a good deal of interesting information regarding the construction of the proposed canal. They had been on the Isthmus a little more than a month, having been among the first to arrive, the latter part of February. Little had as yet been accomplished. A trail had been blazed through the forest, and some excavation had been made at a place called Paraiso. It was hoped that the canal would be finished by 1888. It was to be a sealevel canal, fifty-four miles long, without locks, but with tida gates at the Panama end. The greatest excavation would have to be at Culebra, where the line crosses the watershed.

The track at first skirted the shore, with the sea on our right and a swamp on our left. We soon came to the mangrove thicket of which I have spoken, and crossed a viaduct spanning an inlet from the sea.

Along the track grew thickets of bananas and p antains, above which towered lofty palms, some of them clothed with hanging ferns (*Nephrolepis biserrata*) Among the most striking of the palms was *Attalea cohune*, here called "corozo," with a lofty trunk and a crown of

large pinnate leaves like drooping plumes. Below them hung the petioles of dead leaves and great clusters of fruit, from which oil is made. The fruits resemble large acorns in form and contain hard, wrinkled kernels which in Mexico are called "coquitos de aceite." Those of an allied species are burned in Brazil for smoking rubber.

Another oil-yielding palm, called "corozo colorado" on the Isthmus, is *Elaeis melanococca,* a species growing in marshy places, with low creeping trunk and enormous pinnate leaves; the fruits are smaller than those of the preceding species, of a bright red on the outside and with a small hard nut. Both the husk and the nut yield oils, but of different kinds. The fruits are crowded in compact clusters from which the hard pointed tips of the floral branches project.

Acrocomia sclerocarpa, called "chunga" on the Isthmus, is the macaw palm or "grigri" of the West Indies. It is closely allied to *Acrocomia vinifera,* which in Central America is called "coyol," and yields a sugary sap from which wine, or toddy, is fermented. The fronds of this species are pinnate but the pinnæ do not all lie in the same plane. The spathe is armed with spines, the fruit is smooth and globose, and the trunk is marked with the scars of the petioles and armed with needlelike spines.

Oreodoxa regia, usually called the royal palm, is one of the most stately and beautiful on the Isthmus, with its smooth columnar trunk and crown of p nnate leaves. The name "palma real," or royal palm, is given to several other species, and should not lead to confusion. Sometimes it is applied to the "corozo" (*Attalea cohune*).

In addition to the palms already described, I may mention *Iriartea exorrhiza,* a slender-stemmed, pinnately-leaved species with its base propped up above the ground by straight inclined roots like those of a pandanus. The surface of the roots is roughened with sharp projecting tubercles, and they are used for grating the meat of ripe

coconuts. On this account, this species is sometimes called the "rasp palm."

Among the dwarf palms of the Isthmus are species of *Chamædorea* and *Geonoma*, some of which have remote lanceolate pinnæ, with the terminal pair suggesting the forked fin of a fish's tail. The young inflorescences of certain species of *Chamædorea* are eaten in Central America and Mexico, and are there known as "tepejilote" ("green corn of the mountains," or "wild roasting ears").

Another small palm, armed with needlelike spines, is *Bactris minor*, sometimes called "caña brava" by the natives and "prickly pole" by the West Indian negroes on the Isthmus; and on the edges of the woods there is a climbing palm, also very prickly (*Desmoncus oxyacanthos*), called "matamba" by the natives, who use it for decorating their altars and for making garlands.*

On the edge of the openings in the forest, trailing over the bushes, grows a pretty climbing fern, *Lygodium radiatum*, with fronds having three to seven segments. The accompanying figure (PLATE 5) was drawn by Mr. Theodore Bolton from specimens of the original collection made on the Isthmus by Dr. Sutton Hayes, one of the most enthusiastic collectors who ever visited this region.

The number of climbing and epiphytal ferns in the woods is remarkable. Among the former was the very common *Polypodium polypodioides* (*P. incanum*), *Polypodium percussum*, with entire linear-lanceolate fronds, *Stenochlæna japurensis*, and a species of *Asplenium* with falcate pinnæ, probably the recently described *A. falcinellum* Maxon. Among the epiphytes were a species of *Nephrolepis*, closely allied to our common Boston fern,

*For an account of the vegetation of the isthmus, see Seeman's Flora of the Isthmus of Panama, in the Botany of the Voyage of the Herald, 1852–57, from which most of the names given above are taken.

with simply pinnate pendent fronds six to eight feet long, growing on the trunks of palm trees. A species of *Elaphoglossum* (*E. Herminieri*) was remarkable for its long, pendent, ribbonlike fronds growing from a basal tuft of fulvous hairlike scales. Species of *Vittaria* resembling tufts of grass grew on the limbs, and several species of *Campyloneurum* were distinguishable by the transverse rows of sori dotting the lower surface of their lanceolate fronds. *Asplenium serratum* with enormous simple fronds, closely resembling *Asplenium nidus*, which I afterwards collected in Polynesia, was common on the limbs of trees, where it perched like huge birds' nests.

A simple-fronded species, first described from the Isthmus, was *Dictyoxyphium panamense*, with the sori in a continuous line bordering the swordshaped fronds. Other terrestrial species were the common *Blechnum occidentale*, *Diplazium grandifolium*, the beautiful "silver fern" (*Ceropteris calomelanos*), and *Adiantum lucidum*, with simply pinnate fronds resembling somewhat those of our common Christmas fern. Perhaps the most beautiful of all was *Asplenium formosum*, growing on shaded rocks in water courses, with fronds similar to those of *Trichomanes*.

I must not forget to mention *Salpichlæna volubilis* (*Blechnum volubile*), a climbing species with enormous bipinnate fronds, comparatively remote lanceolate sterile pinnules, and narrower fertile ones. Several tree ferns are said to occur on the Isthmus; the common species of the canal zone is *Hemitelia petiolata*.

Among the lianas of the forest were species of *Bignonia* with bright-colored trumpetshaped flowers, and a *Bauhinia* with a peculiar flattened zigzag stem like the "monkey ladders" of Brazil. There were also strange-looking Clusias with aerial roots like those of a banyan. Among the common weeds was the sensitive plant (*Mimosa pudica*), which sometimes bordered the track for stretches of a mile or more.

The town of Chagres presented a novel appearance with its small square houses of bamboo. The eaves of the steep roofs thatched with palm leaves projected about three feet beyond the sides of the houses, thus sheltering the thin walls from the rain. Around the thresholds swarmed pigs, goats, dogs, and naked children, the latter with their bellies distended from eating great quantities of bananas. We saw a number of handsome cattle, resembling Jerseys or Alderneys, but with longer horns.

As we skirted the banks of the Chagres, we pictured to ourselves the flotilla of boats in which the English buccaneers with Morgan at their head ascended the river, on their way to destroy the city of Panama, in 1671.

At intervals we passed little huts marked with the names of the various "brigades" or surveying parties. At many places we were besieged with girls and women offering the passengers coconut candy, coconuts, oranges, bananas, hard-boiled eggs, and bread, for sale at prices higher than they could be bought for in New York City. We were now approaching Culebra, the highest point of the route of the canal, where an enormous cut, almost three hundred feet deep, would have to be made. Beyond this point, on the Pacific side of the ridge, the aspect of the vegetation changed, and there was evidence of a marked dry season. Among the most striking features of the vegetation were low spreading bipinnate-leaved acacias and columnar cacti (*Cereus* sp.), the edible fruit of which is called "pitahaya;" and we saw quantities of flat-jointed prickly pears (*Opuntia* sp.).

There are two marked seasons at Panama. The dry season, from December to April, is usually called summer (*verano*). The rainy season, from May to November, is called winter (*invierno*); but about the middle, or latter part of June (St. John's day) there is a short interval of good weather called the "little summer of San Juan." During the dry season the prevailing winds are

from the north. A great deal of the moisture is precipitated by the mountain chain, which forms the backbone of the Isthmus, and the water flows back to the Atlantic through the Chagres and other streams. At the time of our visit, there was considerable sickness on the Isthmus. The most dreaded disease was known as Chagres fever. The French were already constructing hospitals, however, and doing what they could to establish sanitary conditions. We heard afterwards that the principal engineer on the Isthmus, M. Blanchet, who was in charge of the excavations at Culebra, succumbed to the effects of the climate and died before the close of the year.

There is not space here to describe the city of Panama of that time, with its ruins covered with mosses and ferns, its stately cathedral, its market filled with monkeys, screaming parrots, and strange fruits, its money-changers with prehistoric pottery and golden objects from Chiriqui for sale,* its shops where hammocks of the finest quality and beautiful Panama hats are sold, and in some of them pearls from the neighboring pearl fisheries, at prices higher than in New York. One of the most beautiful things we saw was a large terrestrial orchid called "flor del Espiritu Santo," the fragrant flower of which had at its center what looked like a pure white dove with its wings outspread. Its botanical name is *Peristeria elata*.

Before leaving we drove to the top of Ancon hill, behind the city, on which the hospital of the French nuns, of the order of St. Vincent, was afterwards established. From this place we had a beautiful view of the city, with its twin-roofed cathedral and the harbor with its green islets and the men-of-war at anchor. We also took a walk on the sea wall, a part of the ancient fortifications of the city, from which we saw the great bare reef left

*See Holmes, W. H. The Use of Gold and Other Metals among the Ancient Inhabitants of Chiriqui, Isthmus of Darien. Bull. U. S. Bur. Ethnol. **3**: 1–27. *f. 1-22.* 1887.

by the receding tide, which made it impossible for ships to approach within easy distance of the city. In the sky flocks of frigate birds and pelicans were sailing, the former with the grace of eagles, the latter like clumsy clown dogs in a circus, imitating the motions of skilled actors, but imitating them very successfully. It was with great regret that we left the interesting old city and returned to Aspinwall.

On the 9th of March we got under way and headed for Key West.

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Notes on the ferns of the Isle of Pines, West Indies

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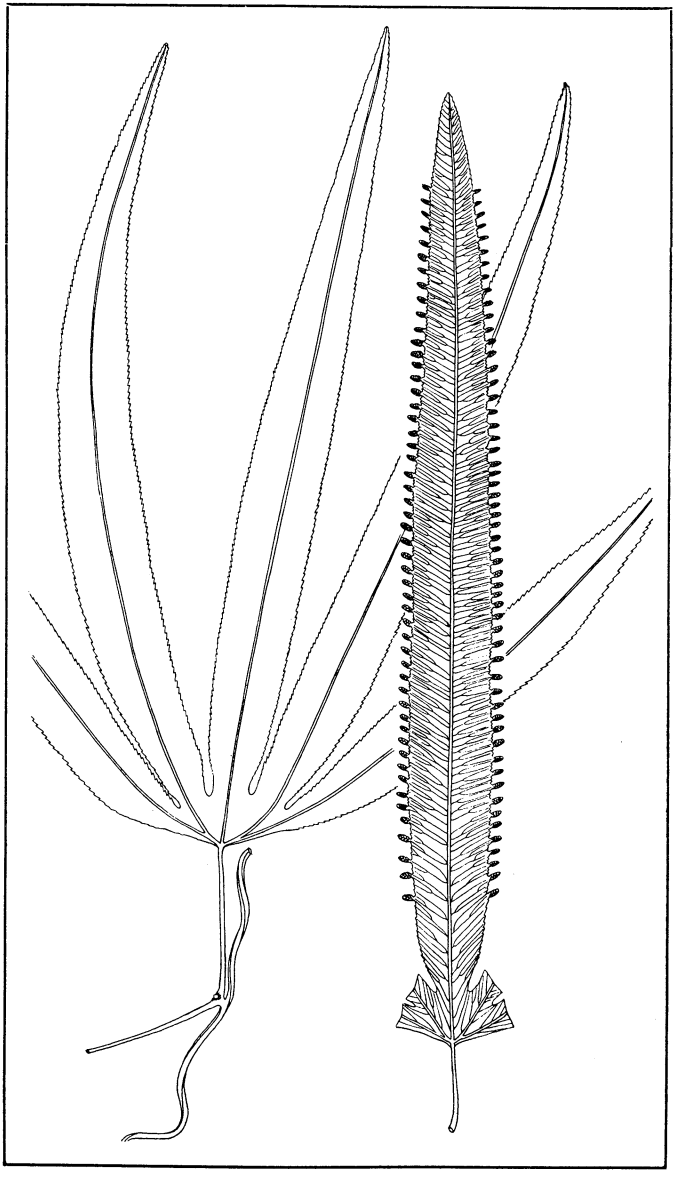
In connection with a natural history expedition from the Carnegie Museum, t became the good fortune of the present writer to devote most of the month of May, 1910, to botanizing in the Isle of Pines, West Indies. A report embodying the botanical results of the expedition will eventually be presented for publication in the Annals of the Carnegie Museum, but it has been suggested that a brief account of the expedition relative to the ferns seen and collected might be desirable for the AMERICAN FERN JOURNAL. With this in view, this article was written.

The Isle of Pines lies about sixty miles south of the west central portion of Cuba, somewhat west of the meridian of Havana, and contains about 1,200 square miles of territory. The island consists, roughly speaking, of two islands, a north one and a south one, separated by a great swamp running east and west. The northern portion is somewhat elliptical in shape and measures about twenty miles across from north to south and thirty



LYGODIUM RADIATUM Prantl, × ½